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AN ASSESSMENT OF CURRENT DIETARY AMINO ACID
RECOMMENDATIONS FOR THE GROWING MEAT RABBIT
BASED ON WHOLE BODY AMINO ACID COMPOSITION.

A thesis presented in partial fulfilment
of the requirements for the degree of
Master of Agricultural Science at
Massey University

WENDY HELEN SCHULTZE

1986

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ABSTRACT

Reservations regarding the amino acid levels recommended by the National Research Council [NRC] (1977) and the Société de Chimie Organique et Biologique [AEC] (1978) for the growing meat rabbit, prompted the use of rabbit whole body amino acid composition values as a first approximation toward determining the ideal dietary amino acid balance, relative to lysine, for this species.

In the absence of whole body amino acid composition data for the growing rabbit, a technique was established for the processing and subsequent chemical analysis of the rabbit whole body. Using the established technique, twelve 53-day-old New Zealand White rabbits were prepared and representative whole body tissue samples were analysed to determine their amino acid contents.

The determined overall mean essential amino acid composition of rabbit whole body (g/kg dry matter) was, lysine 5.05; histidine 2.54; isoleucine 2.57; leucine 5.67; phenylalanine 3.66; tyrosine 2.82; threonine 3.24; valine 3.16; arginine 5.48; methionine 1.49; and cystine 2.32. A comparison of these determined rabbit whole body amino acid values, relative to lysine, compared with the recommendations of NRC (1977) and AEC

(1978), suggested, that the published requirements were overgenerous. In a subsequent study, aimed at determining whether the published dietary amino acid recommendations were indeed excessive, 81 five-week-old New Zealand White rabbits were fed one of a series of nine iso-caloric diets with progressively reduced amounts of crude protein (159 to 97 g/kg) but a fixed level of lysine (6.5 g/kg).

Over a 40-day period the growth performance of the rabbits was similar on the first six diets of the series, but thereafter with decreasing dietary crude protein content there was a linear decrease in growth rate and concomitant increase in the feed conversion ratio.

Urinary nitrogen and urinary urea excretion measured during the experimental period declined progressively from the first to the sixth diet of the series and then plateaued, findings which are in general agreement with the growth performance data. Urinary creatinine excretion showed a decline across diets, indicating, that the rabbits on the higher protein diets were leaner than their counterparts on the diets of lower crude protein.

As the gross amino acid composition of the first diet in the series equated with that of published recommendations, while that of diet six approximated rabbit whole body amino acid composition, it appears that the recommendations are overgenerous and that the dietary ideal amino acid balance may not be far removed from that of rabbit whole body composition. The need for further research to confirm these findings and define more exactly the dietary ideal amino acid balance for the growing rabbit is emphasized.

ACKNOWLEDGEMENTS

Sincere thanks and appreciation are extended to my supervisors, Dr W.C. Smith and Dr P.J. Moughan, for their guidance and assistance during the course of this study. Special thanks are extended to Dr G.S. Wewala for her assistance and advice on statistical matters.

Thanks also to:

Miss C. Butts, Mr M. Carter, Miss J. Cornwell, and Mrs Y.F. Moore for assistance during the trial and chemical analyses.

Mrs G.C. Absolon for advice on rabbit husbandry, cage design, and for supplying equipment for the trial.

Professor D.K. Blackmore for advice and encouragement.

Ruahine Rabbit Cooperative for supplying rabbits.

I acknowledge with gratitude the financial assistance of Doebank and the Federation of Commercial Rabbit Producers.

I was the grateful recipient of a Leonard Condell
Scholarship.

Special thanks are extended to my parents for their
assistance, encouragement, and support during the conduct of this
study.

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